

- c) suspending said continuous film such that said film builds in viscosity and cohesive strength such that [filaments and] any fibers of the substrate [surface] do not penetrate said continuous film; and
- d) contacting said film with said advancing substrate wherein the coat weight of the film is less than $[2]30 \text{ g/m}^2$.

Please add the following new claim:

56. (new) A method of forming a continuous film layer of a thermoplastic composition onto a substrate, said method comprising the steps of:
- a) providing a molten thermoplastic composition;
 - b) advancing a substrate along a path;
 - c) dispensing a continuous film of said thermoplastic composition from a coating device at a coating temperature wherein the thermoplastic composition has a complex viscosity of less than about 500 poise at about 1000 radians/seconds at the coating temperature and a complex viscosity ranging from about 100 poise to about 1,000 poise at about 1 radian/second at the coating temperature;
 - d) suspending said film between said coating device and said substrate; and
 - e) contacting said film with said advancing substrate wherein said substrate is selected from the group consisting of textile material, paper, hook and loop fastening web, polyethylene material, non-woven and combinations thereof.

REMARKS

Applicants thank the examiner for the courtesy extended to their representative at the interview of February 6, 2001

Claim 1 is canceled. Applicants reserve the right to pursue the canceled claim in a divisional at a later date.

Claim 10 has been re-written in independent form. No amendment is made.
Claims 2-12, 35, 42, and 52-54 have been made to depend from Claim 10.

Claim 49 has been amended to correct the dependency.

Claims 55 has been amended to provide better antecedent. Support for the amendment can be found on p. 4, line 28; p. 5, line 10; and p. 8, line 13.

Claim 56 has been added. Support for this can be found on p.4, lines 5-9; p. 6, lines 2-6; p. 7, lines 10-25; and p. 8, lines 1-4.

No new matter is added.

Claims 2-12, 33-42, 44, and 46-56 are pending in the application. Examination and reconsideration of the application is respectfully requested.

A. Rejection under 35 U.S.C. § 112

Claims 49-51 and 55 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicants have amended Claims 49 and 55. The amendments are believed to alleviate the rejections raised by the examiner. Reconsideration is respectfully requested.

B. Rejection under 35 U.S.C. §103(a)

I. Claims 1-6, 8-12, 33-42, 44, 46, 49, 50, 52 and 55 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cardinal et al, in view of Morman et al, optionally further taken with Bunnelle et al.

Applicants respectfully traverse the rejection.

1. For clarification, HTR-8206 was mentioned in the article by Cardinal et al. See p. II-4 at the end of the first complete paragraph. Applicants' invention is related to a method of forming a continuous film layer as a coating on a substrate. There is a limit to how high the coating temperature can reach before any serious damage is done to the substrate. Applicants choose the temperature for the comparative studies to be 240 °C, even though the extrusion temperature of the coating can be higher.

Applicants have now also tested Hytrel 4056 in the same manner as HTR-8206 and the results are submitted in a 132 declaration attached to this response. As shown,

Hytrel 4056's viscosity, measured at 240°C, at 1 radian per second is more than 1000 poise. Thus, the viscosity is also outside the range recited in Claims 10, 33, 44, 46 and 55. See attached 132 declaration by Robert Polance. The viscosity of Hytrel 4056 was further measured at 310° C, and a viscosity of around 500 poise was obtained, which value is similar to what was disclosed by Morman's Hytrel 4056 that had a water inclusion of 0.2%. All of these measurements demonstrate that the materials recited in Cardinal et al. do not have the same properties as recited in the present invention at the coating temperature.

2. Morman et al. discloses melt blowing elastic fibers of a polyetherester polymer to form an elastic non-woven web. See Col. 5, lines 24-33. The fibers are extruded from an extruder having a plurality of orifices as molten strands. See Col. 9, lines 10-36. These fibers combined together to form a web, with gaps and holes, and not a continuous film.

In contrast, Claims 1, 33, 44, 46 and 55 of the present invention are directed to methods of forming continuous film layers, using thermoplastic polymers having specified complex viscosity ranges at the coating temperature. The present invention is not obvious from the combined teachings of Cardinal et al. And Morman et al. For the following reasons:

First, Cardinal et al. discloses Hytrel materials that are not suitable for the present invention, as discussed above. Then, Morman found that these same unsuitable materials form nonwoven webs, not continuous films.

Second, viscosity values are sensitive to the conditions under which the measurements are carried out. The viscosity values cited by Morman et al. were measured at a temperature of 315°C. See Examples 1-22. This temperature, while suitable for melt blowing fibers, is not a suitable temperature for coating a film layer onto a substrate. When extruding to form a fiber web, the temperature at extrusion can be done at as high a temperature as the extruding polymer material itself can withstand, without regard to the substrate. This is not so for coating a substrate, when coating temperature are often lowered so as not to damage the substrate. Thus, at the coating temperature, the viscosity values reported by Morman et al. are outside of the ranges of the present invention.

Third, at the extrusion temperature of Morman et al., care has to be taken to prevent the material from changing color, as noted in the declaration by Dr. Polance.

Fourth, there is no teaching or motivation to combine Cardinal et al. with Morman et al. Even if there was, Cardinal et al. discloses Hytrel materials that are not suitable for the present invention, since the viscosity values are outside the ranges of the present invention, and Morman found that these unsuitable materials can be made into a web by extruding it at a high temperature. The combined teachings do not arrive at the present invention.

Based on the above, Applicants respectfully requested that the rejection should be withdrawn.

3. With regard to Bunnelle et al., Examiner states that Figure 2 depicts a hot melt adhesive composition being extruded onto a non-woven web material and that the slot nozzle was spaced from the non-woven. As discussed in the previous response, in col.13, lines 66-69, it states that, "The band 13 comes into contact with chill rolls 15 and 16 almost immediately after the extrusion step, so that the band will be cooled . . .". Thus, Bunnelle teaches a band of adhesive that is cooled by chill rolls prior to contacting the substrate.

In contrast, the present invention teaches dispensing a continuous film layer of thermoplastic polymers having specified complex viscosity ranges at the coating temperature, from a coating device, with the coating device spaced apart from the path of the substrate. The present invention is not obvious from the combined teachings of Cardinal et al. and Bunnelle for the following reasons:

First, the continuous film layer of the present invention is not cooled by chill rolls prior to contacting the substrate, as taught in Bunnelle. The coating device is spaced a little apart from the substrate so that there is no immediate contact. Also, the distance between the coating device and the path of the substrate is not large enough to accommodate such chill rolls.

Second, there is no teaching or motivation to combine the process of Bunnelle with the polymers of Cardinal to arrive at the present invention. Even if, assuming *arguendo*, that the references could be combined, further cooling the polymers of

Cardinal et al. that were already outside the viscosity ranges of the present invention at 240° C would not arrive at the present invention.

Based on the above, Applicants respectfully request that this rejection should be withdrawn.

In summary, Claims 10, 33, 44, 46 and 55 of the present invention are novel and unobvious. Applicants respectfully requested that the rejection based on 35 U.S.C. §103(a) as being unpatentable over Cardinal et al., in view of Morman et al., optionally further taken with Bunnelle et al. should be withdrawn.

II. Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over references set forth in I and further taken with EP 295,694.

Applicants respectfully traverse the rejection.

EP 295 694 relates to a waterproof water-vapor permeable laminated structure and application of the same. A melted thermoplastic resin is drawn from an extrusion port of a T-die at a melt viscosity of about 5×10^3 Pa.s or more. (See p. 2, lines 48-54).

In contrast, Claim 7 is dependent from Claim 10, and teaches dispensing a continuous film layer of thermoplastic polymer having specified complex viscosity ranges at the coating temperature from a coating device, with the coating device spaced from the path of the substrate. Further, the path of the substrate is in a substantially vertical position after passing the coating device. The present invention is not obvious based on the combine teachings of references set out in I and EP 295,684 reference for the following reasons:

First, EP 295,684 teaches that if the viscosity of the thermoplastic resin immediately after it is extruded is lower than the range of 10^3 to 10^4 Pa.s, a stable film cannot be formed, and hence a laminated film having uniform resin thickness cannot be obtained. See p. 3, lines 5-9.

Second, EP 295,684 further teaches on p.3, lines 26-29, that "when a thermoplastic resin having a melt viscosity of about 1×10^4 Pa.s (100,000 poise) or less was used, pin holes were increased as the viscosity is reduced".

Third, at a viscosity of about 1×10^4 Pa.s, some holes were locally found even at a thickness of $50\mu\text{m}$ ($\sim 47\text{g/m}^2$). See p. 3, lines 28-30.

Thus, EP 295,684 completely teaches away from the present invention of forming a continuous film layer with a thermoplastic polymer having the specified viscosity ranges. Also, there is no teaching or motivation to combine this reference with any other references cited in I above. Even if, assuming *arguendo*, that there was motivation to combine, combining it with either Cardinal et al., Morman et al., or Bunnelle et al. would not arrive at the present invention. Therefore, Claim 7 of the present invention is novel and unobvious, and the rejection under 35 U.S.C. §103(a) as being unpatentable over references set forth in I and further taken with EP 295,694 should be withdrawn.

III. Claims 47-51, 53 and 54 are rejected under 35 U.S.C. §103(a) as being unpatentable over references set forth in I and further taken with applicant's admitted prior art (and/or the state of the prior art at the time of the invention).

Applicants respectfully traverse the rejection.


These claims are dependent from independent Claims 10 and 33, and thus the comments presented above in I with regard to Claims 10 and 33 are applicable here. There is no teaching or motivation to combine the disclosed art with Cardinal et al., Morman et al., and/or Bunnelle et al. As stated above, even if there was, the combined teachings still would not arrive at the present invention. Thus, Claims 47-51, 53 and 54 are novel and unobvious. Applicants respectfully requested that the rejection under 35 U.S.C. §103(a) should be withdrawn.

IV. In summary, Applicants have traversed the rejections under 35 U.S.C. §103(a). Applicants respectfully submit that Claims 2-12, 33-42, 44, and 46-56 are in condition for allowance.

C. Conclusion

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the rejection is respectfully requested and allowance and passage to issue of Claims 2-12, 33-42, 44, and 46-56 at an early date is solicited.

Respectfully submitted,



Nancy N. Quan
Reg. No. 36,248
H.B. FULLER COMPANY
P.O. Box 64683
1200 Willow Lake Blvd.
St. Paul, MN 55164
(651) 236-5620

3/9/01

Date